

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Mathematics B

**Unit 2: Number, Algebra, Geometry 1
(Non-Calculator)**

Higher Tier

Tuesday 1 March 2011 – Afternoon

Time: 1 hour 15 minutes

Paper Reference

5MB2H/01

You must have:

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators must not be used.**



Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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P 3 8 9 7 7 A 0 1 1 6

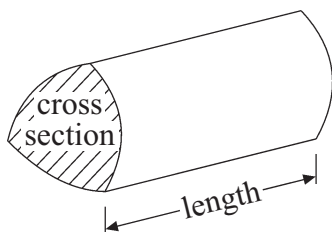
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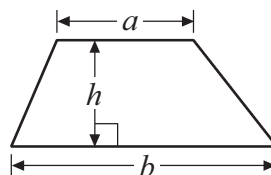
Formulae – Higher Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section \times length

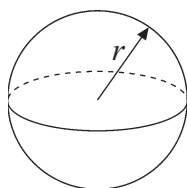


Area of trapezium = $\frac{1}{2}(a+b)h$



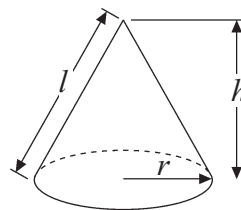
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

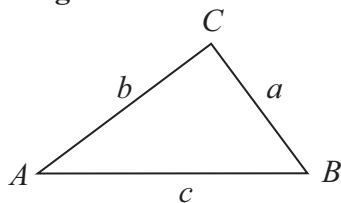


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$

where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 Here are the first four terms of an arithmetic sequence.

5 9 13 17

(a) What is the next term of this sequence?

.....
(1)

(b) Write down an expression, in terms of n , for the n th term of the sequence.

.....
(2)

(Total for Question 1 is 3 marks)

2 Ali, Ben and Candice share £300 in the ratio 2 : 3 : 5

How much money does Candice get?

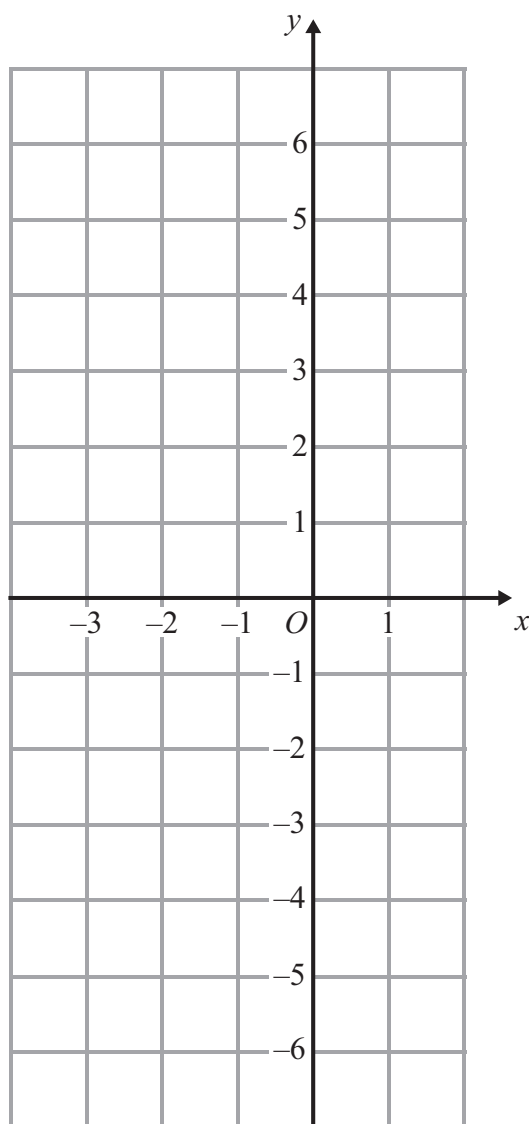
£

(Total for Question 2 is 2 marks)



P 3 8 9 7 7 A 0 3 1 6

- 3 On the grid, draw the graph of $y = 2x + 3$ for values of x from $x = -3$ to $x = 1$



(Total for Question 3 is 3 marks)



- 4 Veena bought some food for a barbecue.
She is going to make some hot dogs.
She needs a bread roll and a sausage for each hot dog.

There are 40 bread rolls in a pack.
There are 24 sausages in a pack.

Veena bought exactly the same number of bread rolls and sausages.

- (i) How many packs of bread rolls and packs of sausages did she buy?

..... packs of bread rolls

..... packs of sausages

- (ii) How many hot dogs can she make?

..... hot dogs

(Total for Question 4 is 5 marks)



5

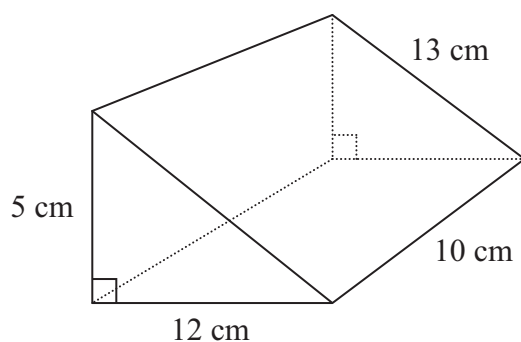


Diagram **NOT**
accurately drawn.

Work out the total surface area of this triangular prism.

(Total for Question 5 is 4 marks)

- 6 The interior angle of a regular polygon is 160° .

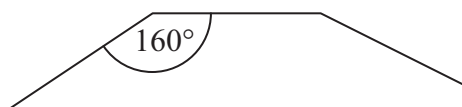


Diagram **NOT**
accurately drawn.

- (i) Write down the size of an exterior angle of the polygon.

- (ii) Work out the number of sides of the polygon.

(Total for Question 6 is 3 marks)



- 7 A piece of card is in the shape of a trapezium.

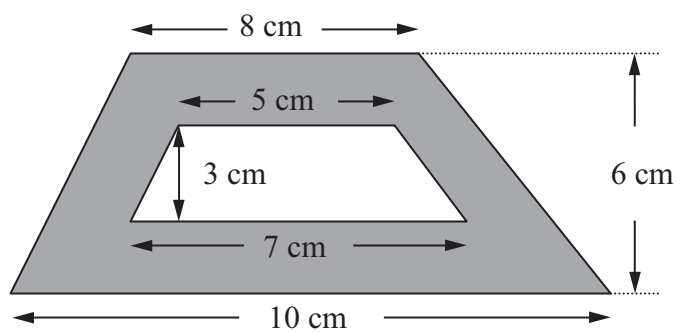


Diagram **NOT**
accurately drawn.

A hole is cut in the card.
The hole is in the shape of a trapezium.
Work out the area of the shaded region.

..... cm^2

(Total for Question 7 is 3 marks)



- 8 The table shows the costs, per person, of a holiday at two different hotels. It shows the cost for 5 nights and the cost for each extra night. It also shows the discount for each child.

	Park Palace		Dubai Grand	
Date holiday starts	5 nights	extra night	5 nights	extra night
01 Jan – 31 Mar	£1169	£150	£849	£86
01 Apr – 09 Apr	£1229	£150	£1219	£95
10 Apr – 15 Jul	£810	£80	£853	£53
16 Jul – 20 Aug	£810	£80	£854	£53
21 Aug – 10 Dec	£810	£80	£869	£94
Discount for each child	$\frac{1}{5}$ off		15% off	

There are two adults and two children in the Smith family.
The family want a holiday for 7 nights, starting on 1st August.

One hotel will be cheaper for them than the other hotel.

Work out the cost of the cheaper holiday.
You must show all your working.



£

(Total for Question 8 is 6 marks)



P 3 8 9 7 7 A 0 9 1 6

- 9 A plane takes 30 seconds to fly a distance of 8 kilometres.

Work out the average speed of the plane, in miles per hour.

..... miles per hour

(Total for Question 9 is 3 marks)

- 10 AB is a line segment.

A is the point $(2, 5, 6)$.

The midpoint of the line AB has coordinates $(-1, -4, 2)$.

Find the coordinates of point B .

(.....,,)

(Total for Question 10 is 2 marks)



11 (a) Expand $3(x + 2)$

.....
(2)

(b) Factorise completely $12x^3y - 18xy^2$

.....
(2)

(c) Expand and simplify $(2x - 3)(x + 4)$

.....
(2)

(d) Simplify $5x^4y^3 \times 2x^3y^2$

.....
(2)

(Total for Question 11 is 8 marks)



12 Write down the value of

(i) 7^0

.....

(ii) 5^{-1}

.....

(iii) $9^{\frac{1}{2}}$

.....

(Total for Question 12 is 3 marks)

13 (a) Write down the equation of a straight line that is parallel to $y = 5x + 6$

.....

(1)

(b) Find an equation of the line that is perpendicular to the line $y = 5x + 6$ and passes through the point $(-2, 5)$.

.....

(3)

(Total for Question 13 is 4 marks)

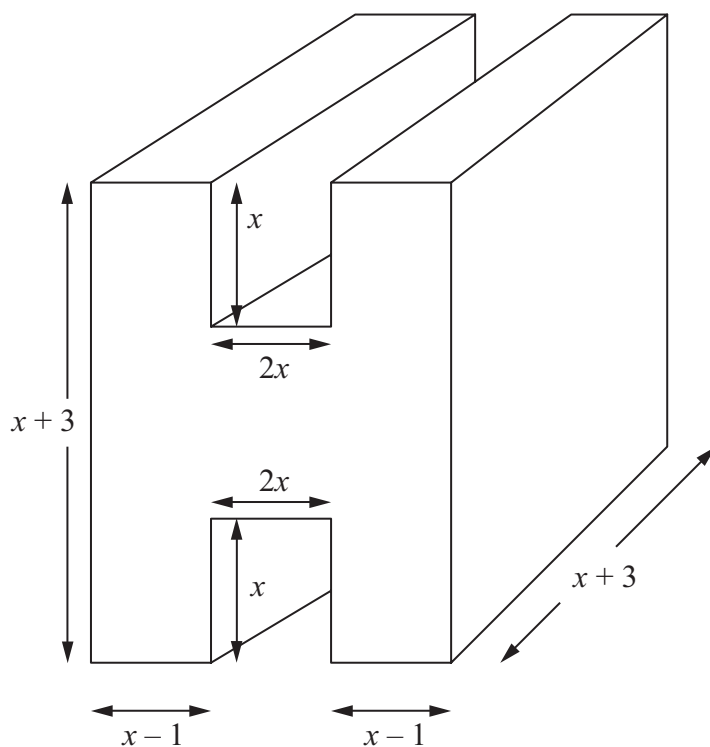


14 Simplify fully $\frac{x^2 - 2x - 15}{x^2 - 4x - 21}$

.....
(Total for Question 14 is 3 marks)



15

Diagram **NOT**
accurately drawn.

The diagram shows a prism.
 All measurements are in cm.
 All corners are right angles.
 The volume of the prism is $V \text{ cm}^3$.

Find a formula for V .

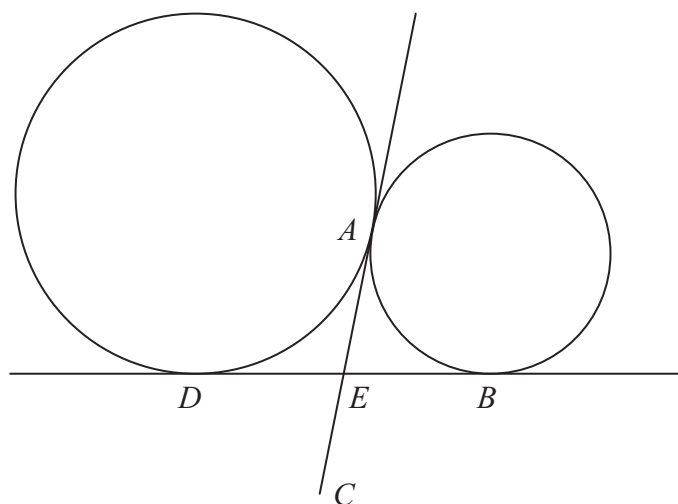
 $V = \dots\dots\dots$

(Total for Question 15 is 4 marks)



*16

Diagram **NOT**
accurately drawn.



A and D are two points on the circumference of a circle.

A and B are two points on the circumference of a smaller circle.

DB and AC are tangents to both circles.

E is the intersection of DB and AC .

E is the midpoint of AC .

Prove that $ABCD$ is a rectangle.

(Total for Question 16 is 4 marks)

TOTAL FOR PAPER IS 60 MARKS



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